

stored-up fat must have been derived from carbohydrates.

Wolff also quoted recent experiments by A. von Planta and Erlenneyer at Munich, with bees, (1) in which it was proved "that wax had been formed from sugar."

Lastly, in 1880-81, Soxhlet made experiments with three pigs at the agricultural experiment station at Munich. (2) The animals were five to six months old; they were fed for a preliminary period of 321 days with equal but limited amounts of barley meal. No. 1 was then killed and analyzed; No. 2 was fed for 75 days, and No. 3 for 82 days, with 4.4 pounds steamed rice per head per day for most of the time, but only three-fourths as much afterwards. Meat extract was also given for 50 days. Finally, Nos. 2 and 3 were killed and analyzed. Calculation showed that the increase of No. 2 contained 14.19 per cent of nitrogenous substance and 25.80 per cent of fat; and that of No. 3, 7.25 per cent of nitrogenous substances and 57.23 per cent of fat. That is, the increase of No. 3 contained only half as much nitrogenous substance, and more than twice as much fat, as that of No. 2; and even the higher proportion of fat (57.23) is low compared with that which would be obtained with animals of good breed and rapidly fattened on appropriate food given ad libitum; while the composition of the increase of No. 2, both as to nitrogenous substance and fat, can hardly be called that of fattening increase at all. Still, calculation showed that, of the total fat in the increase of No. 1, 79.35, and in that of No. 3, 81.84 per cent, must have been derived from the carbohydrates of the food.

Notwithstanding the extraordinary difference in the composition of the increase of Soxhlet's pigs, No. 2 and No. 3, after having been fed alike, he says that only our experiment No. 1 is admissible for calculation, because it is only in that case that the initial and final composition was determined in parallel animals. He, in fact, accepts our least conclusive result, obtained with food abnormally rich in nitrogenous substance, and repudiates our most conclusive experiments with appropriate fattening food. Accordingly, he maintains that we had only shown the probability of the formation of fat from the carbohydrates, and that his own results as above were the first to prove it.

I think the discussion of the results of the nine experiments recorded in Table 70 (p. 35-v. August number) must have sufficed to show that in some of them a very large proportion of the fat of the increase to have been produced from the carbohydrates. The mode of calculation adopted showed, however, a maximum amount of the fat of the increase to have been possibly derivable from fatty matter in the food, a maximum amount of the nitrogenous substance of the food to be available for fat formation, and a maximum amount producible from a given amount of nitrogenous substance, and hence, a minimum amount necessarily derived from carbohydrates. But, as the results so calculated, and discussed with due reservation on these points, are those upon which we have for so many years maintained that the formation of fat from carbohydrates has been proved, and as it is those re-

sults, and the conclusions drawn from them, that have instigated so much subsequent investigation leading to the confirmation of our views, I have thought it desirable prominently to direct attention to the evidence as so brought out.

(To be continued)

The Farm.

PRACTICAL FARMING.

(by James Dickson, Trenholmvilla).

Top dressing meadows—Harvesting turnips—Storing turnips—Top dressing meadows.

With due deference to the opinion of the Editor, I venture to again refer to this subject. It is one well worthy of discussion.

On this subject, in the last issue, while alluding to the experiments, I said that "the manure is placed in a retort, " or furnace, and dried perfectly, and "done with." (I alluded to the mode in some of the cities in Germany of drying nightsoil for transport). The Editor's note says, "By no means." The experiments of Prof. Shutt were "conducted very differently. Well "rotted manure was exposed every day "to the sun for a month". On a second look however, it will be observed, that the Professor's method of drying, and that of Germany were alike. That is, as I observed, "dried perfectly, and done with" and consequently, as I observed, "there is no analogy whatever." As it is the continuous waste, the daily solubilisation resulting from the rain and sun, not sufficient to wash the juices into the ground, but the slight wettings sufficient to solubilise a certain amount which is liberated by next days sun and wind. Thus, it will be seen that although Prof. Shutt was quite correct, an experiment made in that way, and also the practice in Germany, does not apply in practical farming. It cannot be desired, that to solubilise the soil, or manure, it is necessary that air and moisture come into contact with it. Dry earth will not grow a plant, nor will dry manure yield its virtue, but the moment it is moistened, a plant can extract from it its strength, and the atmosphere also. Call it suction, attraction, or evaporation as you will. But I challenge to the proof, that in either case the loss is water only.

I trust my referring back to this subject will be excused on account of the vast importance of the matter. There cannot be too much discussion on this subject. And if it causes even only a few farmers to be more careful of manure, and study each for himself where the waste comes in, their example will result in greater success in practice. (1)

HARVESTING TURNIPS

(Continued from June Number)

To harvest turnips I have never seen anything to beat the willing "Farmers boy" of the old Country. He seems anxious to get the "dirty job done," and the turnips are pulled and cut with scarcely an interval between the up and down of his back. The secret of the matter being that he "learnt to do it that way".

I have always used a piece of scythe for a knife made in the form of No 2 in

(1) I fear the practice of every English farmer who occupies permanent grass-land is utterly, obstinately opposed to Mr. Dickson's ideas.—Ed.

an article in a late issue of the Journal. A handy farmer can easily make them, and they last a lifetime. The only tools necessary are a hammer, cold chisel, brace and bit. A worn out scythe will do, but a broken new one is much better. It is heavier for the length, and the back is farther from the edge. Make the blade part 8 to 10 inches long, using a piece of the back about 6 inches long for the handle. A piece of dry basswood or poplar makes a good handle. Saw off a block long enough to allow of the end of the scythe-back being bent to hold the handle on. In the rough block, bore a hole to insert the scythe-back, and shape the handle to suit. A blacksmith will do the iron work in a few minutes. With this implement tackle the second row, pull a turnip, strike it back and forth once on the nearest turnip, break the other roots off with the back of the knife, turn the hand towards the score between the second and third rows, and with a slight swing, raise the turnip upwards, at the same time bringing the knife down, cutting the top from the turnip. Throw the top on a pile, also in the same row, separate from the turnips. Thus, there will be a pile of tops alternately with a pile of turnips. The third row will now be handled in the same way, and on the same piles, as also, the first and fourth rows. Again take the second row, then the third, the first, and fourth as before. Thus, there will be the turnips and the tops of four rows in one, and good room for a road between. It is better to cart each day's cutting each evening. "A change of work is as good as a rest." In the ground and with the tops on they stand quite a frost, but from some reason, they do not keep as well if frozen to the same extent when not attached to the ground. Cart the large ones separate from the small and tainted. Observe, I say cart, not wagon, between the two there is a great difference in the labour. (2)

Having disposed of the turnips we will now proceed with the tops. The usual method of turning the cattle into the turnip field to eat up the tops cannot be too strongly condemned. They are scoured, and that for some time after cleaning the field on account of the dirt they have eaten. And I cannot understand where the economy comes, from ploughing them in. I have no experience in that way, but to me it looks like ploughing in a crop of oats or clover, after it is in the cock, in place of feeding it to stock and putting the manure back upon the land. Like the turnip, there is a certain amount of good feed in the top, and properly fed, is a great help while feeding coarse forage. Proceeding on this assumption, put the side posts and boards on the cart, use a two tined fork to pack on the tops, dump in a convenient place to feed to the cattle in the yard, make a longitudinal heap about two (2) feet at the base, tapering to a peak, with a few long leaves thrown across the top. And, observe, if the heaps are made too large they will spoil, properly done, they will keep perfectly. If the field is not required, draw and feed as necessary. There is economy in feeding a reasonable daily allowance on the frozen ground, or in racks, before snow falls. In this, I have endeavoured to describe the method I have practised for decades of years.

STORING TURNIPS

Turnips are a heavy thing to handle and everything ought to be made as

(2) Rather 1.—Ed.

convenient as possible, else the extra labour will discourage the cultivator, and draw heavy on the profits of an otherwise paying crop. I remember being taken many years ago into the barn cellar of the largest feeder in the country at that time. In each of the four corners of the cellar, containing about 1500 bushels of turnips, there was a fallow candle and a man with an axe in one hand, and a turnip in the other, cutting for the cattle. There were nearly 100 oxen in the stables, and the four men had all they could do, to "do the chores." But oxen were then five cents a pound live weight, on the spot, and the same class of beef would now scarcely bring more than half of that here. Thus it will be seen there is a need of study as to the cheap production of beef, else "ends won't meet."

Different circumstances suggest different methods, but that of storing the turnips in the house cellar, and carrying them from there to the stable is what very often prevents the more general cultivation of turnips.

It is heavy, unpleasant work. Where there is a barn basement, and the cattle kept there, the matter is easily arranged by having a bin and a trap door in the barn floor. When the basement is used for manure and young cattle, a bin can be made in the same way, but by about Christmas the frost is generally too intense to allow of them being kept there longer. Several loads can be kept in the barn floor for feeding in November. In any case, the small and tainted ones ought to be put there, to be fed in the early part of the season. One thickness on the floor can be sliced nicely with a sharp shovel. The large ones do not require cutting. (1) At first some of the cattle may refuse to feed, but in a short time they will take to them as kindly as a boy to a peach apple, and with as little need of a knife. Sometimes it may be necessary to store the large ones in the house cellar for spring feeding. In that case, it will be found most convenient to bag them, sled them to the stable, and empty as used. It will often be found better to discontinue feeding entirely during the three coldest months. They will thus be fed at the fall end of the season when the coarse forage is being fed, and the winter beef fattened, and again in the spring, when cows and ewes require loosening, and strengthening. I am now referring to a harvest of three or four hundred bushels and if every farmer would arrange to have about that quantity, the convenience (?) of fattening animals in the fall would be very obvious. And many a good cow has been lost in the spring, or the profit of her year's work lost, for the want of a half a bushel a day for three weeks before her calving. The same remark applies to sheep. It is sometimes said "Turnips are not good for horses." (2) Neither are too many apples good for boys. Give the old mare ten pounds a day.

STATE OF THE CROPS AND FRUIT.

Early harvest—Yield—Frozen corn—Packing fruit—Inspection of fruit—Butter, &c.

Since my last was written, the crops south and west of the city of Quebec have all been garnered in, an early

(1) How about choking.—Ed.

(2) Swedes are at any rate.—Ed.

(1) *Bienenzeitung*, v. A. Schmidt, 1878, p. 181.

(2) *Ztschr. landw. Ver*, Bayern, 1881, pp. 423-436.